

## **REMARKS**

Claims 24-33 are pending in this application, claims 2-7, 9-11 and 13-23 having been canceled and claims 24-33 having been added. Reconsideration in view of the following remarks is kindly requested.

### **Summary of Examiner Interview**

Initially, Applicants' representative wishes to thank Examiner Behrend for his time at the interview of June 2, 2005, the contents of which are summarized below.

Prior to the Interview, Applicants' representative provided discussion points. At the Interview, no agreement could be reached as to pending claims 2-7, 9-11 and 13-23. However, Examiner Behrend was receptive to Applicants proposed claims which could further distinguish the cited art of record, but he could not enter the claims as such would allegedly require additional consideration after final.

Accordingly, in an effort to overcome the objections and rejections and expedite prosecution, Applicants have cancelled claims 2-7, 9-11 and 13-23 and added new claims 24-33. New claims 24-33 have been added as a result of the interview with Examiner Behrend, and are based on the discussion in the interview of the prior art cited by Examiner.

### **Claims Drawn to Non-Elected Invention**

As previously pending claims 2-7, 9-11 and 13-23 have been canceled by this amendment, the objection as to claims 7, 13 and 16 is now moot.

### **Claim Rejections – 35 U.S.C. §112**

Previously pending claims 9, 14, 15 and 17-21 were rejected under the first paragraph as allegedly failing to fulfill the written description requirement of the first paragraph of 35 U.S.C. §112. Additionally, claims 9, 10, 14, 15, 17-21 and 23 were rejected under the first paragraph as allegedly failing to fulfill the enablement

requirement of the first paragraph of 35 U.S.C. §112. As these claims have been cancelled, this rejection is now moot.

Previously pending claims 2-6, 9-11, 14, 15 and 17-21 were rejected as allegedly being vague, indefinite and incomplete. As previously pending claims 2-6, 9-11, 14, 15 and 17-21 have been canceled by this amendment, this rejection is now moot.

New claims 24-33 have been drafted in light of the suggestions at the interview in an effort to place the claims in better form for U.S. practice and to comply with the second paragraph of 35 U.S.C. §112.

### **Claim Rejections – 35 U.S.C. §103**

Previously pending claims 2-6, 9-11, 14, 15 and 17-23 stood rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over any of Aoyama et al. (USP 5,432,829), Orii et al. (USP 6,735,267) or Koyama et al. (USP 6,335,956) in view of Ueda et al. (USP 5,068,082) alone or with either Bender et al. (USP 6,600,800) or Ogiya et al. (USP 4,968,479). This rejection is respectfully traversed, and is inapplicable to new claims 24-33 as set forth below.

Initially, claims 2-6, 9-11, 14, 15 and 17-23 have been cancelled, thus the rejection as to these claims is now moot. New claims 24-33 have been drafted in an effort to provide further protection for Applicants invention and to distinguish over the applied art of record, and are the result of discussions with and suggestions from Examiner Behrend. Claims 24 and 28 have thus been drafted to more accurately reflect the example embodiment of FIG. 2, and claim 31 has been drafted to reflect that illustrated in FIG. 3.

As to claim 24, Applicants submit none of Aoyama et al., Orii et al. or Koyama et al. teach or suggest of a fuel bundle for a boiling water reactor, comprising, at least:

a plurality of fuel rods including full-length rods and part-length rods arranged as a plurality of concentric fuel-rod rings within the channel around the water passages, the part-length rods further comprising:

a first part-length rod group consisting of two subsets in a mirror-image, facing relationship to one another, each subset further consisting of three part-length fuel rods in a triangular orientation and directly adjacent to a given side of the pair of water passages so as to face the other subset on the other side of the water passage pair, and

a second part-length rod group consisting of four pairs of part-length rods, each part-length rod pair centrally located in an outmost ring of the bundle adjacent a corresponding one of the four sides of the channel. (underlining for emphasis)

In Orie et al. (FIG. 17 appears most relevant), there is shown only short rods in a paired-facing relationship, with short rod pairs centrally located on each side of the channel.

There is thus no teaching of a first part-length rod group consisting of two part-length fuel rod subsets in a mirror-image, facing relationship to one another, each subset further consisting of three part-length fuel rods in a triangular orientation and directly adjacent to a given side of the pair of water passages. This is further no teaching of a second part-length rod group consisting of four pairs of part-length rods, each pair centrally located in an outermost ring of the bundle adjacent a corresponding one of the four sides of the channel. Orie et al. is inapplicable to new claim 24 for at least these reasons.

Of the figures relied on by the Examiner in Koyama et al. (FIGS. 1, 3, 9, 11-14), none teach or suggest either of the above features.

In the most relevant figure of Aoyama et al. (FIG. 14), there is shown only partial-length rods in a paired-facing relationship (2 pairs of 2 rods) on either side of three water passages, with partial-length rod pairs centrally located on each side of the channel. The claimed invention recites a pair (2) of water passages, not three water rods.

There is also no teaching of a first part-length rod group consisting of two part-length fuel rod subsets in a mirror-image, facing relationship to one another, each subset further consisting of three part-length fuel rods in a triangular orientation and directly adjacent to a given side of the pair of water passages. Aoyama et al. is inapplicable to new claim 24 for at least these reasons.

However, the Examiner relies on numerous figures in Ueda et al. (FIGS. 6, 8, 10, 19, 29, 32, 40-42, 44, 46, 47, 49, 50, 56, 60, 63, 68 and 69) to allege that it is well known to provide two groups of part-length rods with the longer group positioned next to the channel wall and the shorter group positioned proximate the water rods (Final OA of May 4, 2005, page 4). Bender et al. and Ogiya et al. were merely cited for a teaching of placing short rods near a water channel and intermediate rods near a channel boundary.

However, new claim 24 does not recite the above, general structure of a fuel bundle. Claim 24 recites a specific fuel rod arrangement in which a first part-length rod group consists of two part-length fuel rod subsets in a mirror-image, facing relationship to one another, and each subset further consists of three part-length fuel rods in a triangular orientation and directly adjacent to a given side of the pair of water passages.

Absent the Examiner finding this specific claimed configuration in Ueda et al., (only FIGS. 19 and 68 are relevant, showing four partial-length fuel rod subsets arranged around a single water channel), Ueda et al. fail to cure the deficiencies present in each of Orii et al., Koyama et al. and/or Aoyama et al. For at least this additional reason, claim 24 is submitted to be allowable over the art of record, as the combination of references fail to teach each and every feature of claim 24.

Claims 25-27 are allowable by virtue of their dependency on claim 24, submitted to be in condition for allowance.

Claim 28 recites, *inter alia*,

a pair of centrally located, circular-shaped water passages arranged within a 10X10 fuel-rod matrix bounded by four sides of a channel, the fuel rods including full-length and part-length fuel rods,

wherein the 10X10 fuel-rod matrix consists of two, three part-length rod subsets in mirror image relationship with one another, each three-rod subset configured in a triangular orientation and directly adjacent to the pair of water passages so as to face the other subset, and consists of eight additional part-length rods arranged in four pairs, each pair centrally located on an outermost row or column of the matrix nearest a corresponding one of the channel sides

Absent the Examiner finding this specific claimed configuration in the cited references, which Applicants submit do not exist in any of the cited references, claim 28 is submitted to be allowable over the art of record for the above-noted features.

Claims 29 and 30 are allowable by virtue of its dependency on claim 28, submitted to be in condition for allowance, and/or for the further features recited therein.

Claim 31 recites, *inter alia*, wherein the 10X10 fuel-rod matrix consists of a first rod group consisting of two pairs of part-length rods arranged on either side of a corner of the square water-passage, and a second rod group consisting of two pairs of part-length rods and at least two non-paired part-length rods, each of the two pairs and the at least two non-paired part-length rods located in a corresponding outermost row or column of the matrix adjacent a corresponding side of the channel.

Absent the Examiner finding this specific claimed configuration in the cited references, which Applicants submit do not exist in any of the cited references, claim 31 is submitted to be allowable over the art of record for the above-noted feature.

Claims 32-33 are allowable by virtue of its dependency on claim 31, submitted to be in condition for allowance, and/or for the further features recited therein.

### **Objection Under 37 CFR 1.78(b)**

By this Amendment, claims in the instant application no longer conflict with claims 1-10 and 12-17 in Application No. 10/748,175. Withdrawal of the objection is kindly requested.

### **CONCLUSION**

Accordingly, in view of the above remarks and amendments, reconsideration of all outstanding rejections and allowance of each of claims 24-33 in connection with the present application is earnestly solicited.

Pursuant to 37 C.F.R. § 1.17 and § 1.136(a), Applicants respectfully petition for a one (1) month extension of time for filing a response in connection with the present application, and the required fee of \$120.00 is attached.

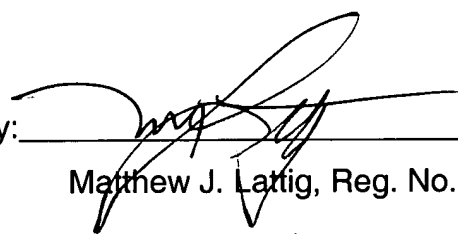
If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to contact the undersigned at (703) 668-8026 (direct).

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge any underpayment or non-payment of any fees required under 37 C.F.R. §§ 1.16 or 1.17, or credit any overpayment of such fees, to Deposit Account No. 08-0750, including, in particular, extension of time fees.

Respectfully submitted,

HARNESS, DICKEY & PIERCE, P.L.C.

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